

Amendment to the Claims

Please withdraw claims 3, 4, 31, 32, 34, 35, 46 and 47 without prejudice to consideration of these claims upon allowance of a generic claim. Following is a complete listing of claims, as amended:

1. (Previously Presented) A method of forming a conductive interconnect in a microelectronic device, the method comprising:
providing a microfeature workpiece having a plurality of dies;
forming an open passage extending through the microfeature workpiece from a first side of the microfeature workpiece to an opposite second side of the microfeature workpiece;
after forming the passage, forming a conductive plug in the passage adjacent to the first side of the microelectronic workpiece; and
depositing conductive material in the passage to at least generally fill the passage from the conductive plug to the second side of the microelectronic workpiece.
2. (Original) The method of claim 1 wherein forming a conductive plug includes depositing an electrically conductive material in the passage using a maskless mesoscale materials deposition process.
3. (Withdrawn) The method of claim 1 wherein forming a conductive plug includes applying an electronic ink in the passage using an electronic printing process.
4. (Withdrawn) The method of claim 1 wherein forming a conductive plug includes depositing an electrically conductive material in the passage using a nano-particle deposition process.
5. (Original) The method of claim 1 wherein forming a conductive plug includes depositing silver in the passage.

6. (Previously Presented) The method of claim 1, further comprising forming a bond-pad on the microelectronic workpiece, wherein forming the open passage includes forming the open passage through the bond-pad, and wherein forming a conductive plug in the passage includes depositing a conductive material to contact an exposed surface of the bond-pad.

7. (Previously Presented) The method of claim 1 wherein forming the open passage includes laser drilling the open passage through the die.

8. (Previously Presented) The method of claim 1 wherein providing a microfeature workpiece includes providing a die having an integrated circuit and a bond-pad electrically coupled to the integrated circuit, and wherein forming the open passage includes laser drilling the open passage through the die and the bond-pad.

9. (Original) The method of claim 1, further comprising applying a passivation layer to at least a portion of the passage before forming the conductive plug in the passage and filling the passage from the conductive plug to the second side of the microelectronic workpiece.

10. (Original) The method of claim 1, further comprising forming a bond-pad on the microelectronic workpiece in contact with the conductive plug.

11. (Original) The method of claim 1 wherein depositing conductive material in the passage to at least generally fill the passage includes biasing the conductive plug at an electrical potential.

12. (Withdrawn) The method of claim 1, further comprising forming a metallic layer on the first side of the microelectronic workpiece in contact with the conductive plug.

13. (Withdrawn) The method of claim 1, further comprising forming a metallic layer on the first side of the microelectronic workpiece in contact with the conductive plug, wherein

depositing conductive material in the passage to at least generally fill the passage includes biasing the metallic layer at an electrical potential.

14. (Withdrawn) The method of claim 1 wherein forming a conductive plug includes depositing an electrically conductive material in the passage using solder tent technology.

15-27. (Canceled)

28. (Previously Presented) A packaged microelectronic device comprising:
a die having a first side and a second side opposite to the first side, the die further having an integrated circuit positioned between the first and second sides;
a bond-pad positioned on the first side of the die and electrically coupled to the integrated circuit;
a passage extending completely through the die and aligned with and extending through the bond-pad;
a first conductive material deposited in a first portion of the passage adjacent to the first side of the die to form a conductive plug electrically connected to the bond-pad;
and
a second conductive material deposited in a second portion of the passage in contact with the conductive plug to at least generally fill the passage from the conductive plug to the second side of the die.

29. (Original) The packaged microelectronic device of claim 28, further comprising an insulative layer deposited in the passage between the die and the first and second conductive materials.

30. (Previously Presented) The packaged microelectronic device of claim 28, further comprising an insulative layer deposited in the passage between the die and the first and second conductive materials.

31. (Withdrawn) The packaged microelectronic device of claim 28 wherein the first conductive material includes an electronic ink in contact with an exposed surface of the bond-pad.

32. (Withdrawn) The packaged microelectronic device of claim 28 wherein the first conductive material includes a nano-particle deposition in contact with an exposed surface of the bond-pad.

33. (Previously Presented) A microfeature workpiece having a first side and a second side opposite to the first side, the microfeature workpiece comprising:

at least one die;

a bond-pad formed on the first side of the microfeature workpiece;

a passage extending completely through the bond-pad and the die from the first side of the microfeature workpiece to the second side of the microfeature workpiece;

a first conductive material deposited in a first portion of the passage adjacent to the first side of the microfeature workpiece to form a conductive plug in contact with the bond-pad; and

a second conductive material deposited in a second portion of the passage in contact with the conductive plug to at least generally fill the passage from the conductive plug to the second side of the microfeature workpiece.

34. (Withdrawn) The microfeature workpiece of claim 33 wherein the first conductive material includes an electronic ink.

35. (Withdrawn) The microfeature workpiece of claim 33 wherein the first conductive material includes a nano-particle deposition.

36. (Previously Presented) The microfeature workpiece of claim 33, further comprising an insulative layer deposited in the passage between the die and the first and second conductive materials.

37. (Withdrawn) The microfeature workpiece of claim 33, further comprising a metallic layer formed on the first side of the microfeature workpiece.

38. (Canceled)

39. (Original) A microelectronic device set comprising:
a first microelectronic device having:

a first die with a first integrated circuit and a first bond-pad electrically coupled to the first integrated circuit, the first die further including a passage extending completely through the first die and the first bond-pad; and
a conductive interconnect deposited in the passage, the conductive interconnect including a first conductive material deposited in a first portion of the passage to form a conductive plug, and a second conductive material deposited in a second portion of the passage in contact with the conductive plug to at least generally fill the passage; and

at least a second microelectronic device having a second die with a second integrated circuit and a second bond-pad electrically coupled to the second integrated circuit, wherein the second bond-pad is electrically coupled to the conductive interconnect of the first microelectronic device.

40. (Original) The microelectronic device set of claim 39 wherein the first microelectronic device is attached to the second microelectronic device in a stacked-die arrangement.

41. (Original) The microelectronic device set of claim 39, further comprising a solder ball disposed between the conductive interconnect of the first microelectronic device and the second bond-pad of the second microelectronic device to electrically couple the first bond-pad to the second bond-pad.

42. (Original) The microelectronic device set of claim 39 wherein the passage is a first passage, wherein the second microelectronic device further includes a second passage extending through the second die and the second bond-pad, and wherein the second passage is completely filled with a third conductive material.

43. (Original) The microelectronic device set of claim 39 wherein the first microelectronic device further includes a redistribution layer formed on the first die, the redistribution layer including a conductive line having a first end portion attached to the first bond-pad and a second end portion positioned outward of the first end portion, wherein the second end portion is configured to receive electrical signals and transmit the signals to at least the first integrated circuit of the first die and the second integrated circuit of the second die.

44. (Previously Presented) A microelectronic device set comprising:
a first microelectronic device having:

- a first die with a first integrated circuit and a first bond-pad electrically coupled to the first integrated circuit, the first die further including a passage aligned with and extending through the first bond-pad; and

- a conductive interconnect deposited in the passage, the conductive interconnect including a first conductive material deposited in a first portion of the passage to form a conductive plug in contact with the bond-pad, and a second conductive material deposited in a second portion of the passage in contact with the conductive plug to at least generally fill the passage; and

at least a second microelectronic device having a second die with a second integrated circuit and a second bond-pad electrically coupled to the second integrated circuit, wherein the second bond-pad is electrically coupled to the first bond-pad of the first microelectronic device.

45. (Previously Presented) The packaged microelectronic device of claim 44, further comprising an insulative layer deposited in the passage between the first die and the first and second conductive materials.

46. (Withdrawn) The packaged microelectronic device of claim 44 wherein the first conductive material includes an electronic ink in contact with an exposed surface of the bond-pad.

47. (Withdrawn) The packaged microelectronic device of claim 44 wherein the first conductive material includes a nano-particle deposition in contact with an exposed surface of the bond-pad.

48. (Previously Presented) The method of claim 1, further comprising applying a passivation layer to at least a portion of the passage before forming the conductive plug in the passage, and wherein depositing conductive material in the passage to at least generally fill the passage includes depositing the conductive material in contact with the conductive plug and the passivation layer.

49. (Previously Presented) The packaged microelectronic device of claim 28, further comprising an insulative layer deposited in the passage, wherein the second conductive material contacts the conductive plug and the insulative layer.

50. (Previously Presented) The microfeature workpiece of claim 33, further comprising an insulative layer deposited in the passage, wherein the second conductive material contacts the conductive plug and the insulative material.

51. (Previously Presented) The microelectronic device set of claim 39 wherein the first microelectronic device further includes an insulative layer deposited in the passage, and wherein the second conductive material contacts the conductive plug and the insulative layer.

52. (Previously Presented) The microelectronic device set of claim 44 wherein the first microelectronic device further includes an insulative layer deposited in the passage, and wherein the second conductive material contacts the conductive plug and the insulative layer.